CLAIMS

What is claimed is:

1   1. A method of congestion control in a communication network, comprising

2   rate limiting packet transmissions over selected communication links within the

3   network at control nodes thereof; and

4   modulating the rate limiting according to buffer occupancies at the control nodes.

1   2. The method of claim 1 wherein the rate limiting comprises modulation of packet

2   bandwidths of traffic streams utilizing the selected communication links.

1   3. The method of claim 2 wherein the modulation of the packet bandwidth is performed

2   dynamically in response to measured network performance metrics.

1   4. The method of claim 3 wherein the network performance metrics are selected from the list

2   including: throughput of the selected communication links input to the control nodes and/or

3   buffer occupancy level at the control nodes.

1   5. The method of claim 3 wherein the network performance metrics are measured according

2   to at least one of: a moving average of the measured quantity, a standard average of the

3   measured quantity, or another filtered average of the measured quantity.

1   6. The method of claim 2 wherein the modulation of packet bandwidths is achieved by

2   varying an inter-packet delay time over the selected communication links at the control

3   nodes.

1   7. The method of claim 1 wherein the control nodes are located upstream of congested nodes

2   within the network.

1   8. The method of claim 1 wherein the control nodes are located downstream of congested

2   nodes within the network.

1   9. The method of claim 1 wherein the control nodes are located on only a few of a number of

2   communication links that are coupled to a congested node within the network.

1   10. The method of claim 1 wherein the control nodes are associated with only a fraction of a

2   total number of traffic streams applied to a congested node within the network.

1   11. The method of claim 1 wherein the modulating according to buffer occupancies is

2   performed according to a modulation function that is linear in nature.

1   12. The method of claim 1 wherein the modulating according to buffer occupancies is

2   performed according to a modulation function that is quadratic in nature.

1   13. The method of claim 1 wherein the modulating according to buffer occupancies is

2   performed according to a modulation function that is step-wise in nature.

1   14. A communication network comprising a number of nodes interconnected with one

2   another through one or more communication links, a first one of the nodes being configured

3   to control packet loss within the network by rate limiting packet transmissions over selected

4   ones of the communication links, such rate limiting being modulated according to buffer

5   occupancy at the first one of the nodes.

1   15. The network of claim 14 wherein the rate limiting is modulated according to a

2   modulation function that is one of linear, quadratic or step-wise in nature.

1   16. The network of claim 14 wherein the rate limiting comprises modulation of packet

2   bandwidths of traffic streams utilizing the selected communication links.

1 17. The network of claim 16 wherein modulation of the rate limiting is set empirically

2 according to network conditions.

1 18. The network of claim 16 wherein the rate limiting is performed dynamically in response

2 to measured network performance metrics.

1 19. The network of claim 18 wherein the network performance metrics are selected from the

2 list including: throughput of the selected communication links input to the control nodes

3 and/or buffer occupancy level at the control nodes.

1 20. The network of claim 18 wherein the network performance metrics are measured

2 according to at least one of: a moving average of the measured quantity, a standard average

3 of the measured quantity, or another filtered average of the measured quantity.